DIGITAL REPOSITORY FIGURE CAPTIONS

Figure DR1. Location of samples. Labels for most samples within 1 m of fault are omitted for clarity.

Figure DR2. (A) Fission-track length distributions for select samples; 8B-2 and 8F-2 are samples far from fault whereas 8E-1 and 8E-2 are from within 2–4 cm of fault. (B) Photomicrographs of thin sections of corresponding samples. Scale bars are 0.25 mm.

Figure DR3. Forward modeling of thermal history of sample 8B-2 (far from fault, granodiorite side) using AFTSolve (Ketcham et al., 2000) and annealing algorithm of Laslett et al. (1987). The thick red curve shows best fit after a Monte Carlo simulation with 100,000 runs, whereas gray area indicates range of acceptable fits. Modeling shows that our sample locality was at an ambient temperature between 70 and 80 °C while the fault was active.

DIGITAL REPOSITORY REFERENCES CITED


Table DR1. Apatite Fission Track Analyses - San Gabriel Fault

<table>
<thead>
<tr>
<th>Sample</th>
<th>Distance From Fault (m)</th>
<th># Grains</th>
<th>Standard track density (x10^6 cm^-2)</th>
<th>Fossil track density (x10^4 cm^-2)</th>
<th>Induced track density (x10^4 cm^-2)</th>
<th>Chi square prob. %</th>
<th>Central age (Ma)</th>
<th>Mean track length (µm)</th>
<th>Std. dev. (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8b-1</td>
<td>-0.09</td>
<td>20</td>
<td>1.76 (2866)</td>
<td>12.21 (82)</td>
<td>95.48 (641)</td>
<td>13</td>
<td>36.1 ± 4.8</td>
<td>12.5 ± 0.3</td>
<td>1.18</td>
</tr>
<tr>
<td>8b-2</td>
<td>-67</td>
<td>25</td>
<td>1.79 (2911)</td>
<td>9.82 (77)</td>
<td>102.93 (807)</td>
<td>98</td>
<td>27.3 ± 3.4</td>
<td>11.3 ± 0.2</td>
<td>2.08</td>
</tr>
<tr>
<td>8b-4</td>
<td>0.50</td>
<td>33</td>
<td>2.24 (3586)</td>
<td>26.1 (293)</td>
<td>152.2 (1705)</td>
<td>95</td>
<td>61.3 ± 4.3</td>
<td>12.9 ± 0.3</td>
<td>1.04</td>
</tr>
<tr>
<td>8b-5</td>
<td>-9.0</td>
<td>20</td>
<td>1.85 (2999)</td>
<td>12.2 (67)</td>
<td>117.1 (642)</td>
<td>92</td>
<td>30.8 ± 4.1</td>
<td>12.0 ± 0.9</td>
<td>2.44</td>
</tr>
<tr>
<td>8b-6</td>
<td>-0.39</td>
<td>9</td>
<td>1.85 (2999)</td>
<td>3.5 (9)</td>
<td>35.5 (91)</td>
<td>96</td>
<td>29.2 ± 10.2</td>
<td>11.1 ± 0.5</td>
<td>2.03</td>
</tr>
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<td>8b-7</td>
<td>0.02</td>
<td>40</td>
<td>2.28 (3641)</td>
<td>34.5 (221)</td>
<td>304.7 (1950)</td>
<td>99</td>
<td>41.2 ± 3.2</td>
<td>12.5 ± 0.2</td>
<td>0.67</td>
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<tr>
<td>8b-8</td>
<td>0.05</td>
<td>27</td>
<td>2.28 (3641)</td>
<td>25.4 (215)</td>
<td>209.6 (1777)</td>
<td>85</td>
<td>44.0 ± 3.5</td>
<td>12.6 ± 0.4</td>
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<tr>
<td>8b-9</td>
<td>0.10</td>
<td>29</td>
<td>2.31 (3696)</td>
<td>29.5 (271)</td>
<td>222.4 (2044)</td>
<td>92</td>
<td>48.8 ± 3.5</td>
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<tr>
<td>8b-e</td>
<td>-0.06</td>
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<td>2.08 (3325)</td>
<td>12.6 (75)</td>
<td>107.4 (639)</td>
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<td>38.9 ± 4.9</td>
<td>10.6 ± 0.4</td>
<td>0.96</td>
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<tr>
<td>8b-f</td>
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<td>20</td>
<td>2.06 (3294)</td>
<td>21.3 (152)</td>
<td>166.2 (1188)</td>
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<td>41.2 ± 4.1</td>
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<tr>
<td>8e-1</td>
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<td>20</td>
<td>1.91 (3087)</td>
<td>11.4 (67)</td>
<td>109.5 (645)</td>
<td>94</td>
<td>31.6 ± 4.2</td>
<td>12.1 ± 0.2</td>
<td>1.48</td>
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<tr>
<td>8e-2</td>
<td>0.05</td>
<td>20</td>
<td>2.31 (3696)</td>
<td>16.4 (105)</td>
<td>117.7 (753)</td>
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<td>51.3 ± 5.6</td>
<td>12.5 ± 0.4</td>
<td>1.68</td>
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<tr>
<td>8e-3</td>
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<td>20</td>
<td>2.34 (3752)</td>
<td>16.7 (102)</td>
<td>90.9 (556)</td>
<td>99</td>
<td>68.3 ± 7.7</td>
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<td>17</td>
<td>2.34 (3752)</td>
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<td>64.6 (471)</td>
<td>92</td>
<td>73.5 ± 8.7</td>
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<td>8e-gouge</td>
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<td>12</td>
<td>2.15 (3441)</td>
<td>19.7 (97)</td>
<td>112.8 (556)</td>
<td>63</td>
<td>59.4 ± 7.0</td>
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<td></td>
</tr>
<tr>
<td>8f-1</td>
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<td>20</td>
<td>2.38 (3807)</td>
<td>16.4 (105)</td>
<td>170.3 (1090)</td>
<td>78</td>
<td>36.6 ± 3.9</td>
<td>12.7 ± 0.2</td>
<td>1.18</td>
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<tr>
<td>8f-2</td>
<td>70</td>
<td>20</td>
<td>2.38 (3807)</td>
<td>10.2 (65)</td>
<td>76.3 (488)</td>
<td>98</td>
<td>50.5 ± 6.9</td>
<td>12.2 ± 0.2</td>
<td>1.60</td>
</tr>
</tbody>
</table>

Distances shown are from the center of the ultracataclasite layer to the midpoint of the sample. Negative distances from the fault indicate samples on the granodiorite (south) side of the fault, while positive distances indicate samples from the gneiss (north) side. Samples were processed by d’Alessio and Donelick Analytical: standard magnetic and heavy liquid mineral separation processes were used. All samples were analyzed by Blythe. Apatites were mounted in epoxy. Sample surfaces were ground and polished. Apatite mounts were etched in 7% HNO₃ at 18°C for 22s. An "external detector” (e.g., Naeser, 1979), consisting of low-U (<5 ppb) Brazil Ruby muscovite, was used for each sample. Samples were irradiated in the Cornell University Triga nuclear reactor. Following irradiation, the muscovites were etched in 48% HF at 18°C for 30 min. Tracks were counted using a 100X dry lens and 1250X total magnification in crystals with well-etched, clearly visible tracks and sharp polishing scratches. A Kinitek stage and software written by Dumitru (1993) were used for analyses. Parentheses show number of tracks counted. Standard and induced track densities were determined on external detectors (geometry factor = 0.5), and fossil track densities were determined on internal mineral surfaces. Ages were calculated using zeta = 320 ± 9 for dosimeter glass SRM 962a (e.g., Hurford and Green, 1983). All ages are central ages, with the conventional method (Green, 1981) used to determine errors on sample ages. The chi-square test estimated the probability that individual grain ages for each sample belong to a single population with Poissonian distribution (Galbraith, 1981). * lengths were measured by Blythe on grains exposed to Cf–252 by Donelick Analytical.
Table DR2. Measured track lengths for all samples.

<table>
<thead>
<tr>
<th>Sample</th>
<th>bins (microns)</th>
<th>Mean length</th>
<th>S.D.</th>
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</thead>
<tbody>
<tr>
<td>#</td>
<td>4-5</td>
<td>5-6</td>
<td>6-7</td>
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<tr>
<td>8b-1</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>8b-2</td>
<td>3</td>
<td>3</td>
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<td>2</td>
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<td>0</td>
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<td>8b-6</td>
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<td>2</td>
<td>2</td>
</tr>
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<td>10</td>
<td>5</td>
</tr>
<tr>
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<td>1</td>
<td>6</td>
</tr>
<tr>
<td>8b-e</td>
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<td>3</td>
<td>2</td>
</tr>
<tr>
<td>8e-1</td>
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<td>1</td>
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<td>8f-1</td>
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<td>4</td>
<td>7</td>
</tr>
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